HAZARD MITIGATION GRANT PROGRAM (HMGP)

Benefit Cost Analysis (BCA) WEBINAR

HAZARD MITIGATION GRANT PROGRAM (HMGP)

BCA WEBINAR

BCA Webinar: DR-4814, DR-4825, DR-4839

Introductions:

Alison Maura, State Hazard Mitigation Officer

Shannon Al-Jabi, Chief of Hazard Mitigation Programs

Prabhnoor Multani, Hazard Mitigation Program Lead

Suprit Singh, BCA Specialist

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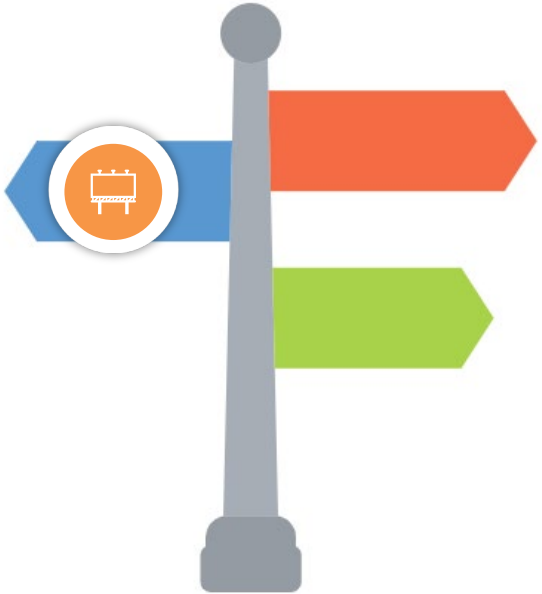
Part 1: Navigating NYS Declared Disasters



NEW YORK STATE | Homeland Security and Emergency Services

NYS DHSES |Hazard Mitigation Grant Program (HMGP)

Open Funding:
Disasters

DR-4814-NY

Severe Storms, Tornadoes and Flooding
(Declared August 29, 2024)

DR-4825-NY

Remnants of Tropical Storm Debby
(Declared September 24, 2024)

DR-4839-NY

Severe Storm and Flooding
(Declared October 21, 2024)

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NYS DHSES |Hazard Mitigation Grant Program (HMGP)

*HMGP funds are based on the estimated total federal assistance, subject to the sliding scale formula that FEMA provides for disaster recovery for each major disaster declaration.

Open Funding: Disasters

DR-4814-NY

Funding Available: ***$4,756,434**
75% Federal Share
25% Non-Federal Share

DR-4825-NY

DR-4839-NY

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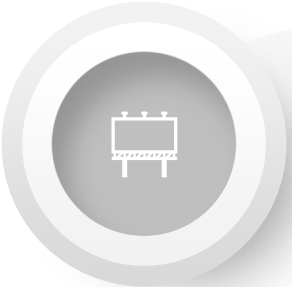
NYS DHSES |Hazard Mitigation Grant Program (HMGP)

Open Funding:
Disasters



DR-4814-NY

DR-4825-NY

Funding Available:
*$6,200,052
75% Federal Share
25% Non-Federal Share

DR-4839-NY

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NYS DHSES |Hazard Mitigation Grant Program (HMGP)

Open Funding: Disasters

Applications Due: 5:00PM EST
Wednesday, April 30, 2025

DR-4814-NY

DR-4825-NY

DR-4839-NY

Funding Available: ***$5,411,815**
75% Federal Share; 25% Non-Federal Share

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Key Dates and Deadlines

DR 4814-4825-4839 Application Deadline:	Submission via Email to:
Wednesday, April 30, 2025 by 5:00PM EST	HazardMitigation@DHSES.NY.GOV

DHSES HM Website: https://www.dhses.ny.gov/hazard-mitigation

Hazard Mitigation Grant Program| Section 404

The Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) program provides funding after a state receives a Presidential Declaration. Section 404 of the Stafford Act authorizes the Hazard Mitigation Grant Program (HMGP).

HMGP funding supports long-term hazard mitigation measures that enhance the State's resiliency, avoid loss of life, increase sustainability and reduce damages to property.

Hazard Mitigation is any action taken to reduce the long-term risk to people or property from natural hazards and their effect.

2024 Hazard Mitigation Assistance (HMA) Program and Policy Guide:

https://www.fema.gov/sites/default/files/documents/fema_hma_guide_082024.pdf

Pre-Calculated Benefits

- FEMA has published various benefit-cost efficiencies to offer predetermined values for cost-effectiveness.
- Using pre-calculated benefits eliminates the requirement for applicants to conduct a separate BCA for eligible projects.
- Pre-calculated benefits are not meant to influence actual project expenses or function as detailed project cost estimates. Individual project cost estimates should be derived from industry standards, vendor assessments, or other approved sources.

Pre-Calculated Benefits

- **Acquisition Projects (Buyout):** if the project cost is under $775,411 per structure and located in the Special Flood Hazard Area (SFHA); no BCA is required.
- **Elevation Projects:** if the project cost is under $355,522 per structure and located in the SFHA; no BCA is required.
- **Hospital Generators:** ≤ $6.95 per hospital building gross square footage (BGSF) in urban areas and $12.62 per hospital BGSF in rural areas.
  - Must have an emergency department
  - Stand-alone solution

BCA Narrative for Projects under $1 Million

For projects with a total cost of less than $1 million, sub-applicants may submit a cost-effectiveness narrative that FEMA will use to validate a project's cost-effectiveness and estimate a BCR:

- How often does the hazard being mitigated occur?
- How many people benefit from the proposed mitigation project, and how was this number determined?
- What structures, infrastructure, and building contents, if any, will be damaged if the project is not implemented?
- What public services (including public safety, transportation, and utilities) and/or businesses, if any, would lose function during future hazard events if the project is not implemented?
- Are there any additional benefits directly attributable to the proposed project that are not captured elsewhere in the cost-effectiveness narrative?

Introduction to the Benefit-Cost Analysis

Stafford Act

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) requires all mitigation projects to have a cost-effectiveness determination as a basic eligibility requirement. This law is carried out under the 44 Code of Federal Regulations (CFR), Emergency Management and Assistance.

FEMA Benefit-Cost Analysis Toolkit 6.0 (Latest Version)

To ensure the project is cost-effective, the applicant and sub-applicant must use FEMA-approved methodologies and the Supplemental Guidance for the BCA Toolkit V6.0.

Cost-Effectiveness

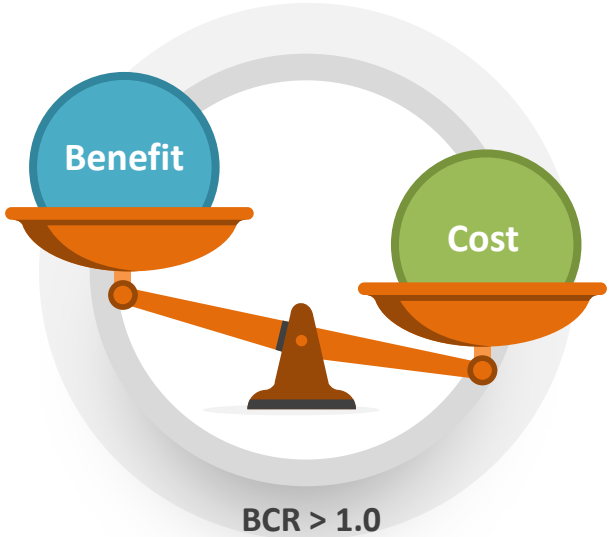
A project is cost-effective when the Benefit-Cost Ratio (BCR) is 1.0 or greater, indicating that the benefits of a prospective hazard mitigation project are sufficient to justify the costs.

Part 2: Understanding The Benefit-Cost Analysis – The BCA

Understanding the Benefit-Cost Analysis

A Benefit-Cost Analysis (BCA) is the process of weighing the benefits of a particular action against its costs.

A Benefit-Cost Ratio (BCR) is equal to the total project benefits divided by the total project cost



BCR = (Total Project Benefits) / (Total Project Cost)
If the benefits outweigh the costs, (BCR > 1.0), the project is deemed cost-effective.

Understanding the Benefit-Cost Analysis

- The BCA compares the conditions before and after the mitigation activity is implemented.
- This tool is utilized to calculate risk reduction in terms of losses avoided. Risk is the severity of the event and its likelihood.
- Losses are calculated based on the size (recurrence interval or frequency of the event) and are determined based on:
  - Historical costs/damages
  - Calculations from engineering analysis
  - Estimated losses

Questions To Ask Before Starting a Benefit-Cost Analysis

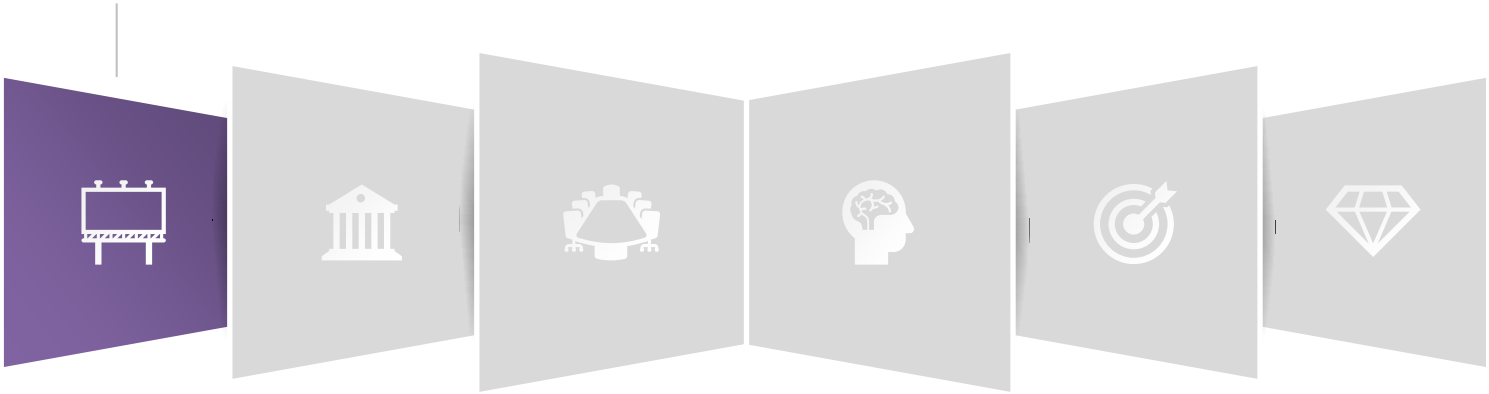
- What is the cost of the project?
  - In addition, how much will it cost to upkeep and maintain this project to its standard level of effectiveness?
- What natural hazard(s) is your project addressing?
- How often does this hazard occur?
- What damages is this community experiencing due to this hazard?
- How much damage will be prevented by implementing this project?

Natural Hazards – Determining Frequency

- Although we cannot predict when hazards will occur, we can estimate how likely they are based on historical events, hazard data, or specific hazard analyses (such as a Hydrologic and Hydraulic [H&H] study)
- The frequency of a hazard occurring can be represented through a Recurrence Interval (RI)
- Determining the recurrence interval requires an engineer's assessment to analyze historical outage data, system vulnerabilities, and risk factors specific to the site. Since this is a key input for the BCA, an engineer's evaluation is necessary to establish a defensible recurrence interval for modeling avoided damages accurately.

Natural Hazards – Determining Damages

Loss of Service

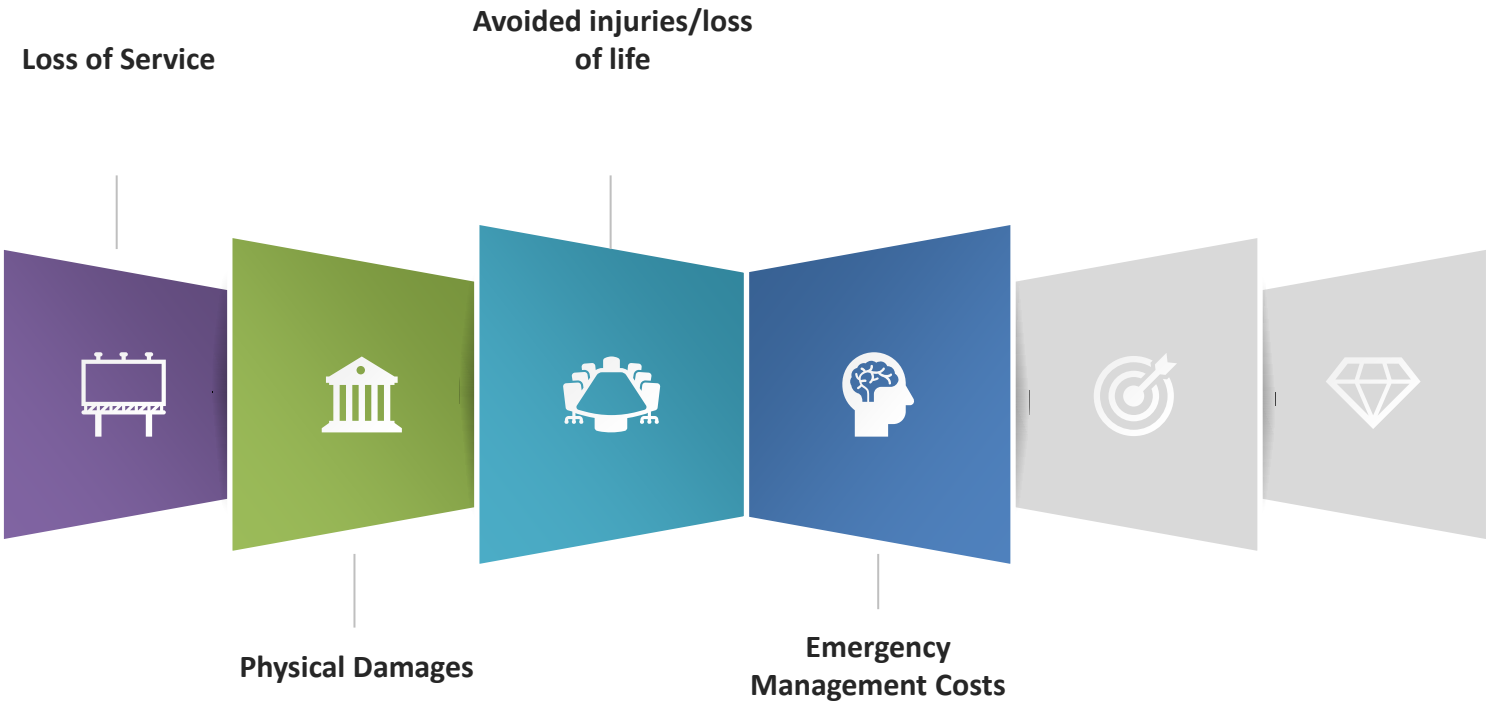


Natural Hazards – Determining Damages

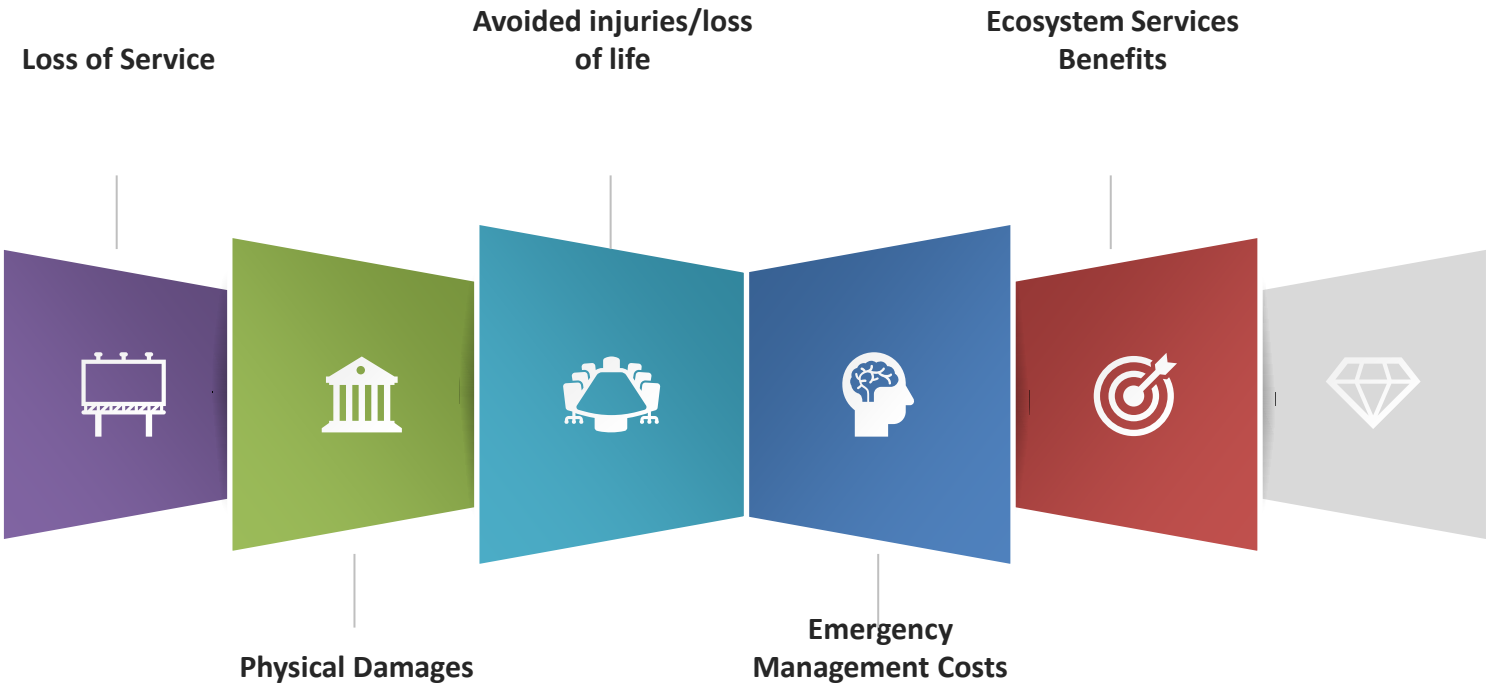
Loss of Service

Physical Damages

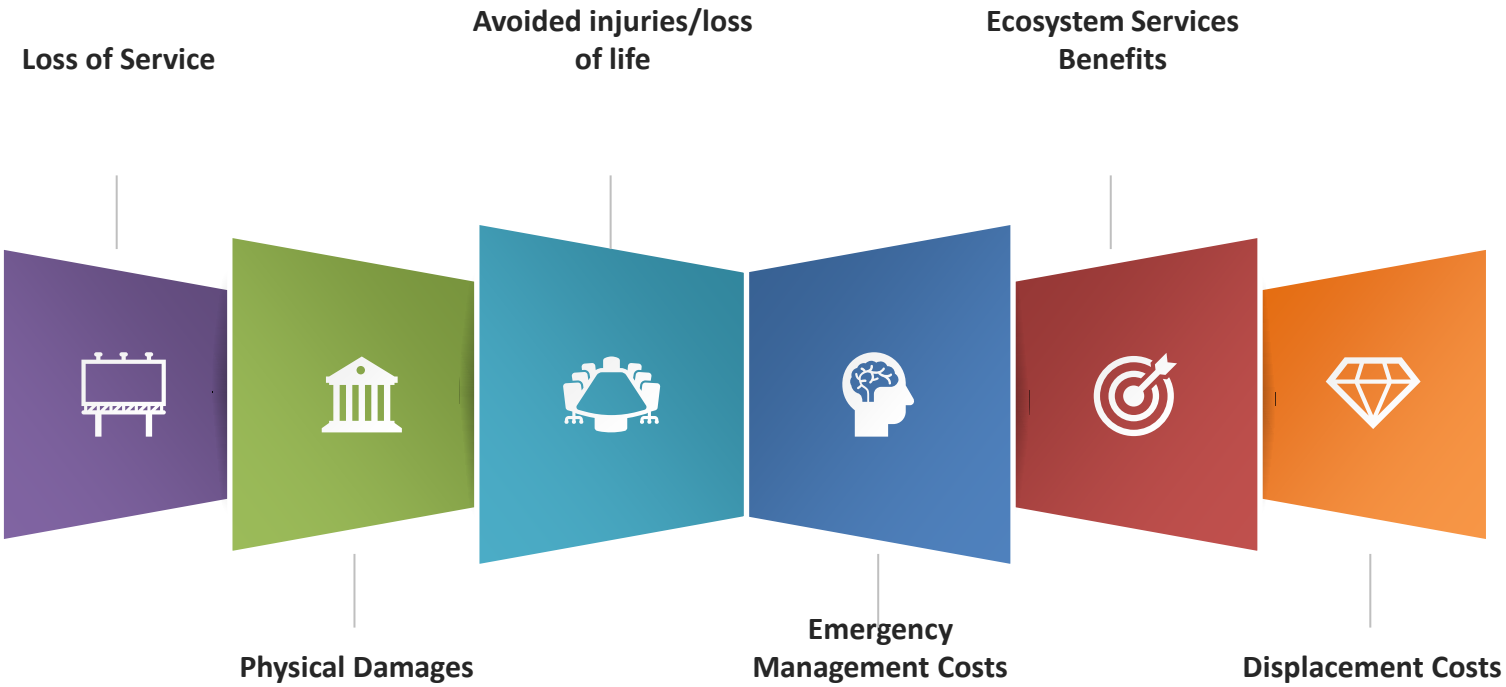
Natural Hazards – Determining Damages



Natural Hazards – Determining Damages



Natural Hazards – Determining Damages



Determining Damages – Loss of Function

- Loss of Function/Service
  - Interruption to critical services, roads, bridges and utilities caused by a natural hazard event.
  - Benefits can be quantified by the value of the function and length of interruption.

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Determining Damages – Loss of Function

- Critical Facilities
  - Benefits are calculated based on mitigation loss of service by allowing police stations, fire stations, hospitals, and other facilities to stay open or reduce their downtime
  - The BCA Toolkit auto calculates the value of service per day for critical facilities based on the inputs for the following questions
    - Population served by the facility
    - Distance to closest alternative facility
  - For "Other" Critical Facilities
    - An annual operating budget and duration of time (i.e., hours or days) that service was lost is required to quantify benefits.

Determining Damages – Loss of Function

- Roads/Bridges
  - Benefits are calculated depending on increased time and distance of detours needed when a road/bridge is lost/closed
- Utilities
  - Benefits are calculated based on FEMA value of service ($/person/day), multiplied by number of customers served and duration of service loss.
  - BCA toolkit uses standard values ($/person/day) for electrical, potable water, and wastewater service.

Loss of Service Type	FEMA Standard Value
Electrical	$213/person/day
Potable water	$150/person/day
Wastewater	$71/person/day

Information Needed to Start a Benefit-Cost Analysis

	Property Location	Property Structure Type	Hazard Type	Mitigation Action Type
What is it?	For each project structure: • Address • Latitude and Longitude	Description/classification of structure as: • Residential • Non-residential • Critical facility building • Utility • Road/bridge	Description of the natural hazard the project intends to address	Describes the specific mitigation project being considered, like: • Floodplain and stream restoration • Elevation / Acquisition • Infrastructure Failure
Where can you get it?	• Title documents, local building inspector, local tax assessor's office • Online mapping services (Google earth, maps etc.)	• Photos of property • Scope of work description • Design drawings • As-Builts	• Historical accounts of past damages and hazards causing them • Information from project manager, project engineer, planner, or other representative familiar with proposed project	• Scope of work description • Information from project manager, project engineer, planner, or other representative familiar with proposed project • BCA Help Menu has detailed mitigation action type descriptions

Supporting Documentation Examples

Type of Project	Examples of Supporting Documentation for Possible Benefits/Proof of Avoidable Damages
Acquisition/ Elevation/ Flood Proofing	• Cost of previous repairs/damages from flooding • Elevation Certificate • Insurance claims • Receipts for work, materials, and volunteer hours associated with repairing flood damage • Engineers' assessment of damage to building • Engineers' mitigation proposal and estimate of reduced flood water elevations in building • Services provided by facility (if it is a commercial building) • Effects of flood events on business

Supporting Documentation Examples

Type of Project	Examples of Supporting Documentation for Possible Benefits/Proof of Avoidable Damages
Drainage Improvement/ Culvert Upgrade	• Detour information for road closure due to flooding • Cost of emergency measures taken in response to flooding • Past Project Worksheets (PWs) for Public Assistance (PA) for that location • Town pay stubs/time sheets for work related to damages from past flooding • Traffic count on road for proposed mitigation project • Official town statement of materials, labor, or equipment used for work related to damages from past flooding

Supporting Documentation Examples

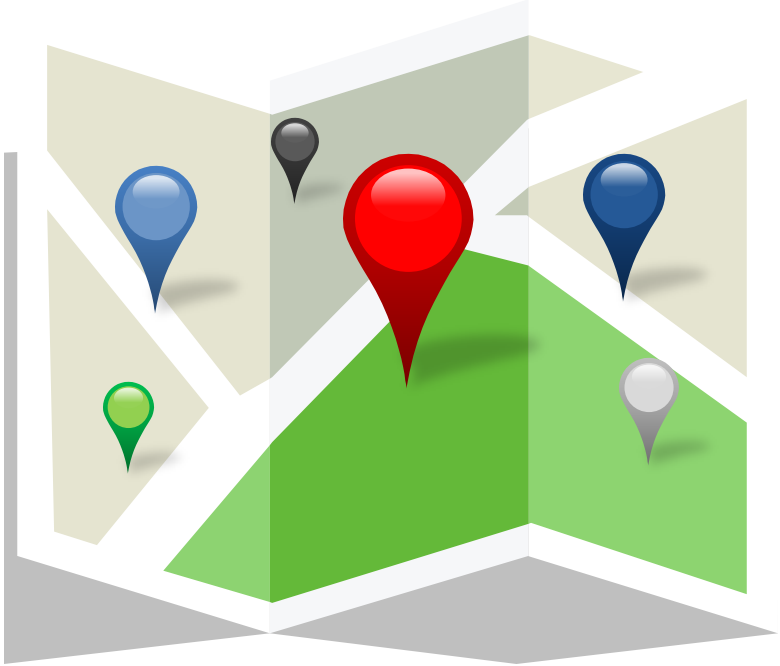
Type of Project	Examples of Supporting Documentation for Possible Benefits/Proof of Avoidable Damages
Generator	• Power outage history at critical facility • Cost of running an emergency shelter for one day • Emergency medical services provided by critical facility • Population served by critical facility • Distance to nearest critical facility in event power was lost

Supporting Documentation Examples

Cost Estimate

Items	Units	Unit Price	Total Price
60kW Generator and ATS	1	$45,000	$45,000
Concrete pad 8” to elevate generator to BFE	1	$15,000	$15,000
Fence Enclosure for Generator	1	$5,000	$5,000
Total			**$65,000**

Supporting Documentation Examples



Google Maps for Detour Routes

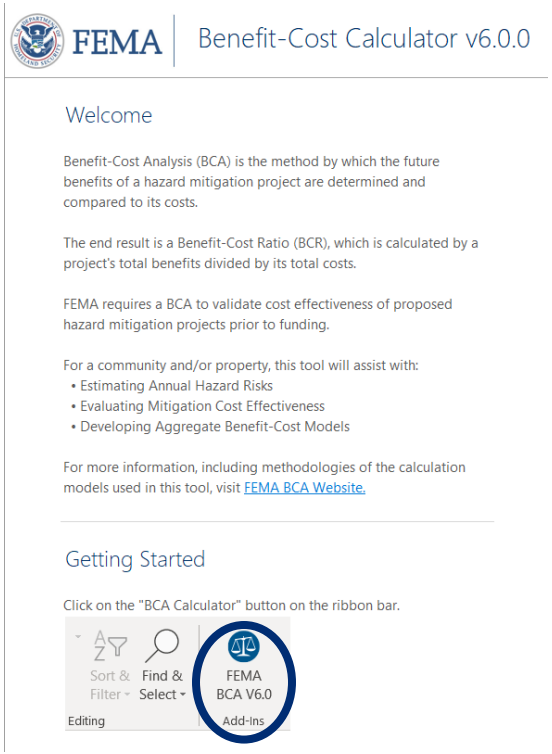
Part 3: BCA Toolkit Version 6.0 - Excel Add-In

Benefit-Cost Analysis (BCA) | Concepts

To evaluate proposed hazard mitigation projects prior to funding, FEMA requires a Benefit-Cost Analysis (BCA) to validate cost-effectiveness.

The project's total net benefits divided by its total project cost is called Benefit-Cost Ratio (BCR). If the BCR is 1.0 or greater the project is considered cost-effective.

To ensure the project is cost-effective, applicant and sub-applicant must use FEMA-approved methodologies and the Supplemental Guidance for the BCA Toolkit V6.0.



BCA Helpline: 1-855-540-6744 (9AM–5PM (EST), M-F)
Email: bchelpline@fema.dhs.gov

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Benefit-Cost Analysis (BCA) | Toolkit Version 6.0

Download the official BCA Toolkit V6.0 Excel template from:

https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis

Users will need Excel 2013 or later, or may use Excel Online Option

Benefit-Cost Analysis Toolkit

Due to Microsoft updates, users with older versions of Microsoft Windows and Excel (2013 and 2016) may experience functionality issues with the BCA Toolkit. If you are using an older version of Windows or Excel, FEMA recommends using the BCA Toolkit in Excel Online.

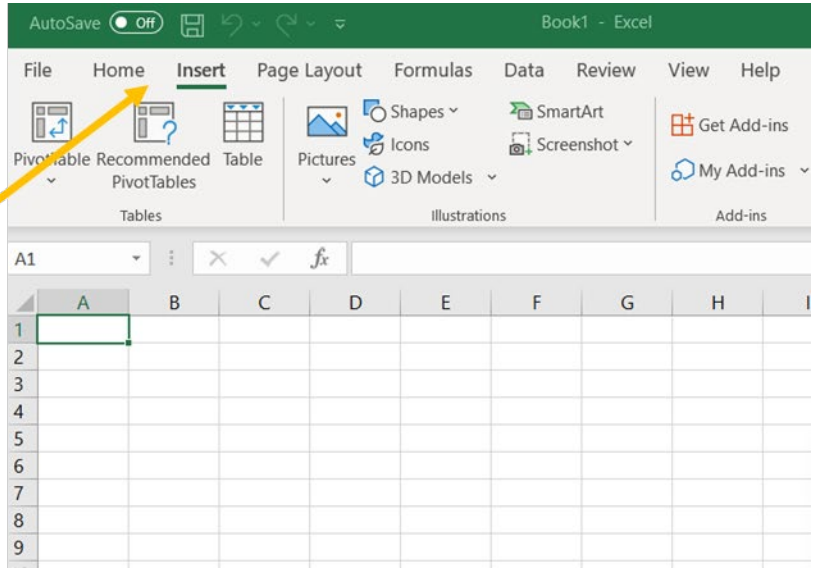
To help complete an analysis within the required guidelines, you must use the BCA Toolkit, which is a calculator developed using FEMA-approved methodologies and tools to show the cost-effectiveness of your projects. Do your BCA early in the project development process to make sure you will meet the cost-effectiveness eligibility requirement.

BCA Toolkit Installation Instructions

BCA Toolkit Version 6.0

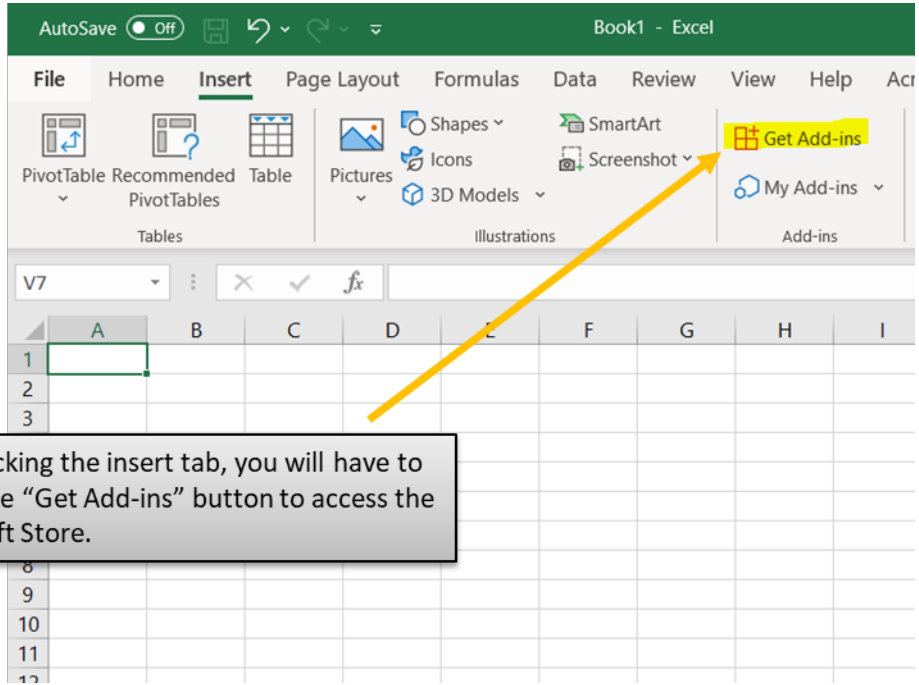
Release Notes July 2020

Benefit-Cost Analysis (BCA) | Toolkit Version 6.0



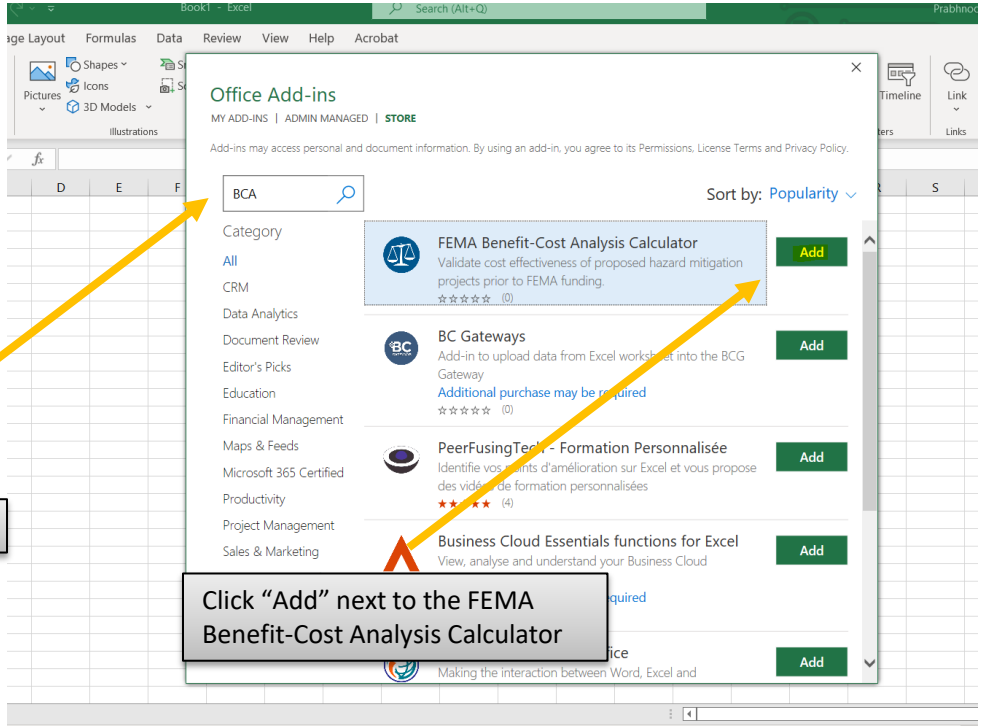
After opening Excel, the first step is to click the "Insert" tab

Benefit-Cost Analysis (BCA) | Toolkit Version 6.0



After clicking the insert tab, you will have to select the "Get Add-ins" button to access the Microsoft Store.

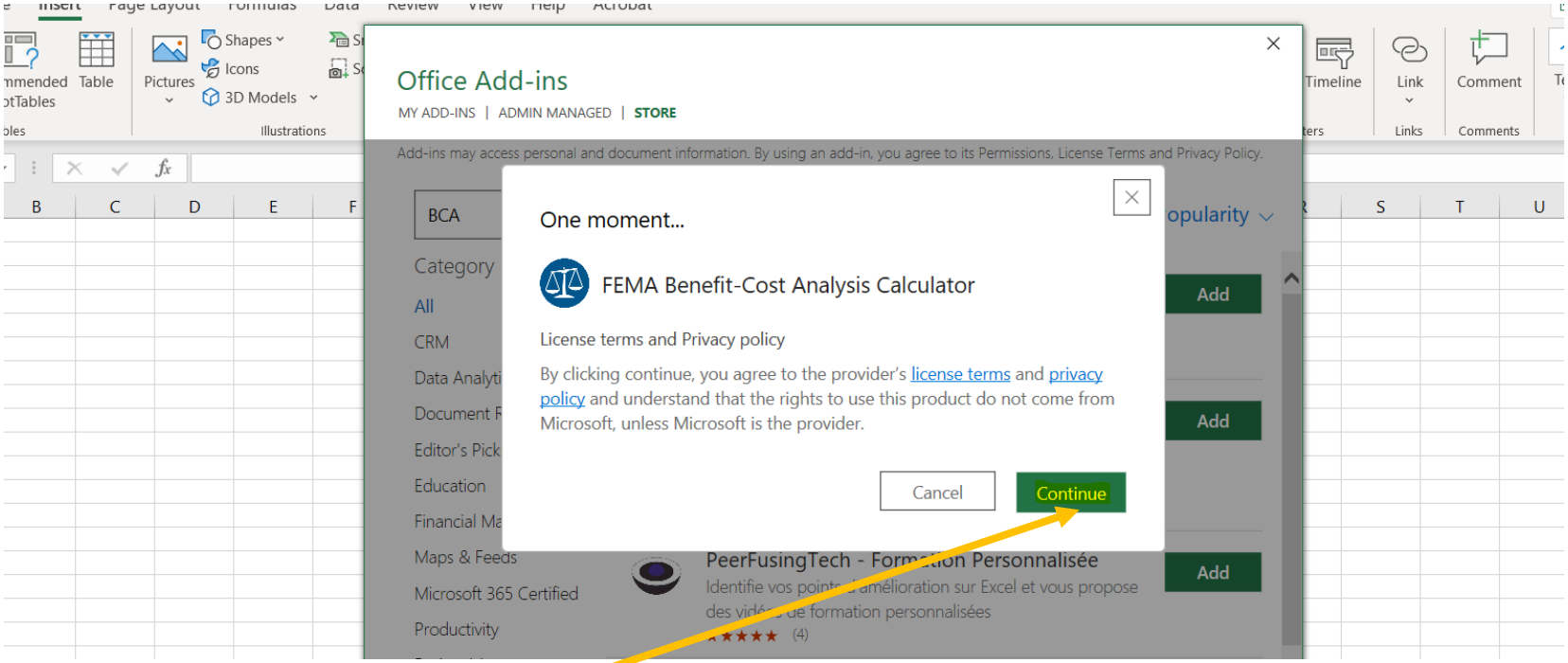
Benefit-Cost Analysis (BCA) | Toolkit Version 6.0



Enter "BCA" into the search bar

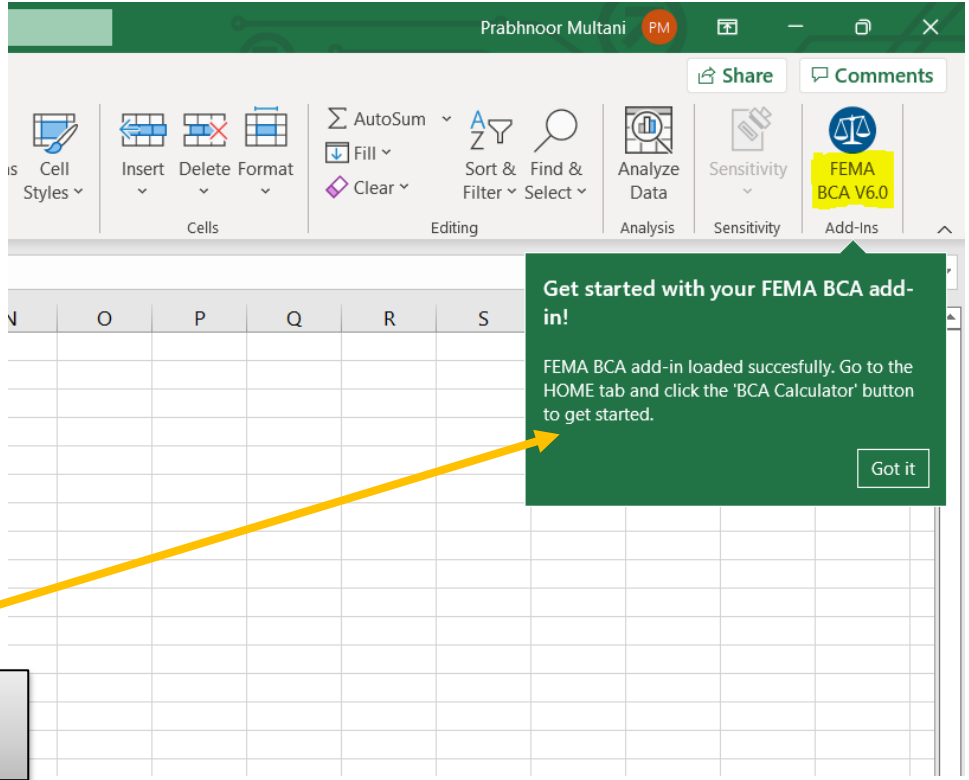
Click "Add" next to the FEMA Benefit-Cost Analysis Calculator

Benefit-Cost Analysis (BCA) | Toolkit Version 6.0



This step requires you to click the continue button.

Benefit-Cost Analysis (BCA) | Toolkit Version 6.0



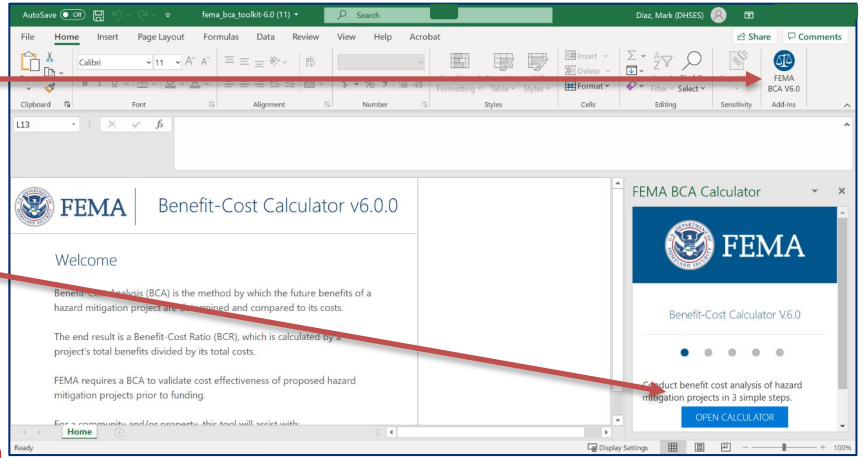
This shows you successfully added the BCA Calculator add-in to Excel

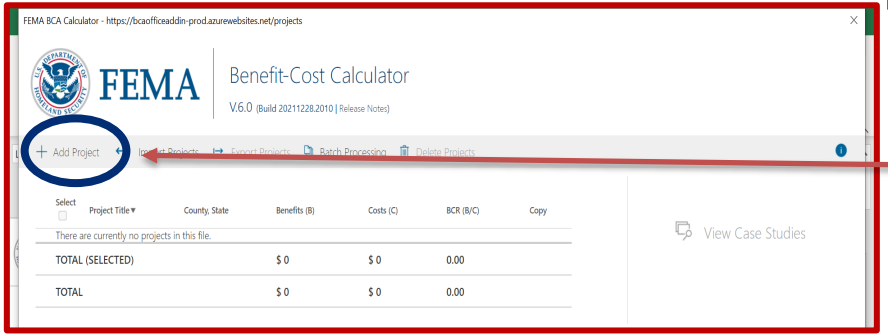
Part 4: BCA Toolkit Version 6.0 - Starting the Analysis

Benefit-Cost Analysis (BCA) | Start

Initial Steps

- Click FEMA BCA V6.0 Icon
- Click “Open Calculator” to begin BCA in a new window





- Click “Add Project” to begin

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Benefit-Cost Analysis (BCA) | Project Configuration

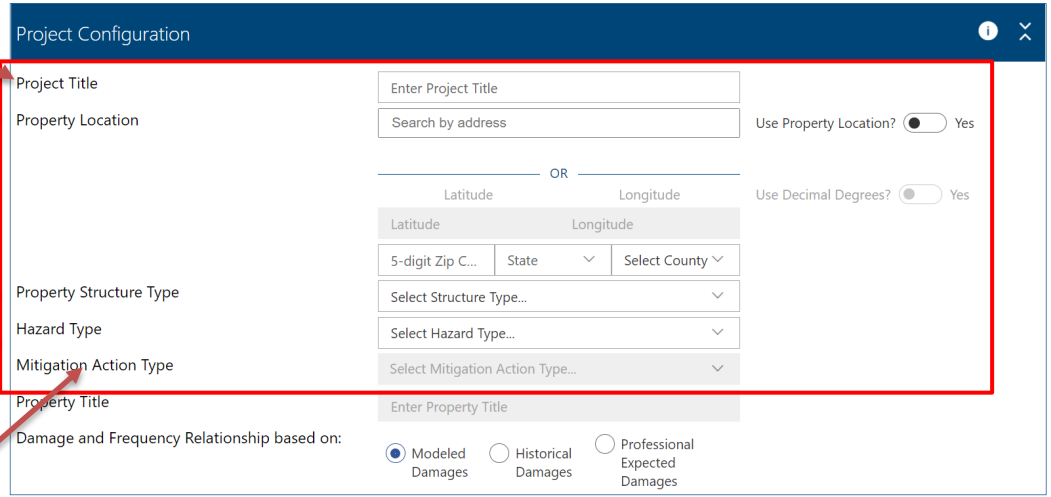
Project Title – Input the same title as used in the sub-application for the project

Property Location- Important to use correct project address or GPS coordinates (Lat/Long)

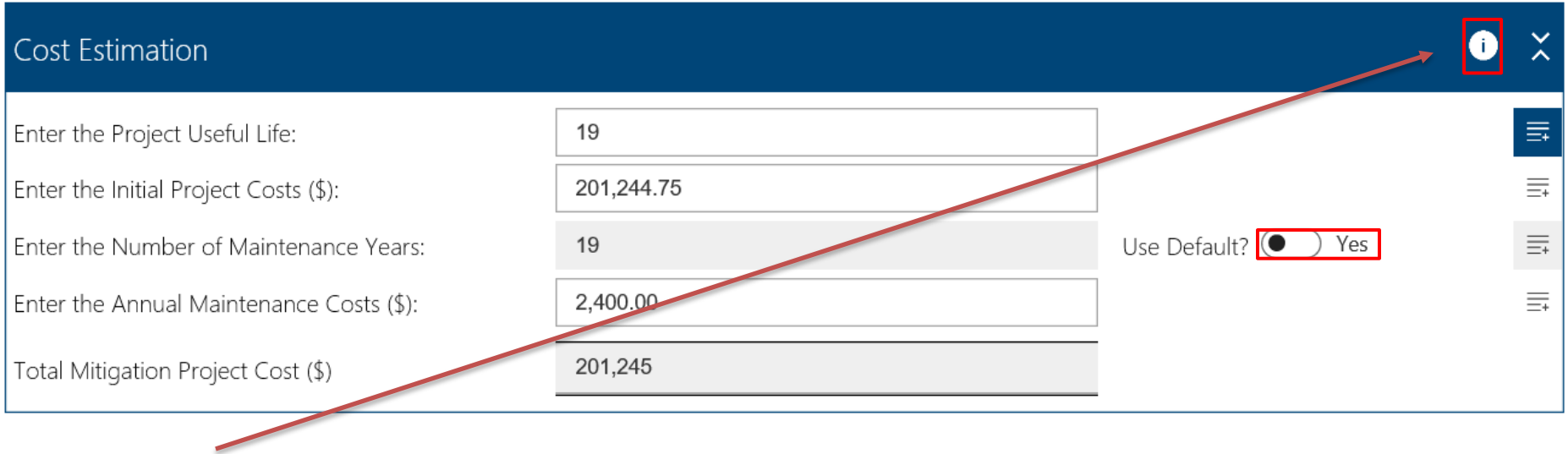
Property Structure Type – Drop down selection (critical facility buildings, utilities, roads & bridges, residential/non-residential, and other)

Hazard Type – Drop down selection for the primary hazard being mitigated

Mitigation Action Type – Drop down selection that best relates to the proposed scope



Benefit-Cost Analysis (BCA) | Toolkit Version 6.0



- The help button ⓘ is a great resource for standard values accepted by FEMA and defining terms used in the toolkit
- Where possible, default values have been populated in the Toolkit. Switch the toggle to “No” to enter a custom value.
- Make sure to always provide a comment and documentation if you do not use the default value provided.

Benefit-Cost Analysis (BCA) | Project Configuration - Damage and Frequency Relationship

Modeled Damages –

Select this option: to perform the analysis on the property, regardless of past damage history. The BCA results for the selected hazard will be modeled based on the inputs provided.

Historical Damages –

Select this option: if Historic damages and losses, and the dates (years) are available.

- Sources of documents for Damages – Utility power outage report, Insurance claims, damage repair records, data from State/local agencies, newspaper citing, FEMA Project Worksheets (PW)

Professional Expected Damages –

Select this option: if the scientific data would show how much damage would result, if a given event were to occur.

- Documentation could include engineering reports, technical studies, etc.
- Documentation must be provided for all damages.

Benefit-Cost Analysis (BCA) | Damage Frequency Assessment

Damage Analysis Parameters - Damage Frequency Assessment

Year of Analysis Conducted:	2021	
Year Property was Built:	1950	
Analysis Duration (years):	72	Use Default? Yes

- **Year of Analysis Conducted** - Typically the current calendar year.
- **Year Property was Built** - When the asset being mitigated was built. e.g., buildings, utilities, roadways and bridges, other assets.
- **Analysis Duration** - Auto-calculated from the difference between the above inputs.

Part 5: Benefit Cost Analysis (BCA) Additional Resources

Benefit-Cost Analysis (BCA) | Additional Resources

FEMA's 2009 BCA Reference Guide**: https://www.fema.gov/sites/default/files/2020-04/fema_bca_reference-guide.pdf

FEMA's 2011 Supplement to the BCA Reference Guide**: https://www.fema.gov/sites/default/files/2020-08/fema_bca_guide-supplement.pdf

FEMA's July 2020 BCA Toolkit 6.0 Release Notes: https://www.fema.gov/sites/default/files/2020-08/fema_bca_toolkit_release-notes-july-2020.pdf

FEMA BCA Toolkit 6.0 Installation Instructions: https://www.fema.gov/fact-sheet/fema-bca-toolkit-60-installation-instructions

** Though their content is based on use of BCA Toolkit version 5.3.0, especially the included screenshots, the general principles discussed still apply to date in BCA Toolkit version 6.0.

Benefit-Cost Analysis (BCA) | Additional Resources

FEMA's 2019 Benefit-Cost Analysis Training Materials (E/L 0276 course): https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis/training

FEMA's How to Complete a Streamlined BCA Page, including updates to the Pre-Calculated Benefit values: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis/streamlined-bca

FEMA Flood Map Service Center (MSC): https://msc.fema.gov/portal/home

FEMA Resilience Analysis and Planning Tool (RAPT): https://www.fema.gov/about/reports-and-data/resilience-analysis-planning-tool

United States Census Bureau, TIGERweb – Geography Division: https://tigerweb.geo.census.gov/tigerweb/

Benefit-Cost Analysis (BCA) | Recurrence Interval Resources

American Society of Civil Engineers data for hurricane windspeed and seismic data by location: https://ascehazardtool.org/

National Weather Service, Precipitation Frequency Data Server: http://hdsc.nws.noaa.gov/hdsc/pfds/

NOAA National Centers for Environmental Information: Storm Events Database at https://www.ncdc.noaa.gov/stormevents

U.S. Geological Survey stream gage data at https://waterdata.usgs.gov/ny/nwis/sw can be used to extrapolate frequency information for flood events.

- See section 2.1.2 from Supplement to the BCA Reference Guide (2011).

Read more on this topic from USGS at: https://www.usgs.gov/centers/new-jersey-water-science-center/floods-recurrence-intervals-and-100-year-floods

HMGP | Technical Assistance Contact

Wrap up and Questions

DHSES has a team available and ready to provide

- Technical assistance with application development
- Assistance with the Benefit-Cost Analysis (BCA)
- Assistance to applicants who are not familiar with the FEMA HMGP process

HazardMitigation@dhses.ny.gov